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Journal Jottings

We are devoting the front
section of this month's Journal
to one article "What is Canada
Doing to Solve the World Food
Shortage?" And with good reason.
It is well worth the space. We
must all — rural and urban
residents alike — be concerned
not only with our own agricultural
production and food requirements
but also with those of other
countries and that is what this
article is all about. It's told by
experts and although much of
what is said is encouraging, there
is much — probably more — that
will leave the reader disheartened.
It seems that we must accept the
unpleasant fact that some must
live and some must die because
there is not enough food for all —
and usually it is the survival of the

richest, not necessarily the fittest.
As our system of aid can be
questioned so it seems can our
motives — are we helping or are
we exploiting? But we in Canada
can question the entire system
only as deeply as we are willing
to dig into our own pockets and
purses for more money. These
are some of the unsavory aspects
revealed by the article but there
is much to leaven the piece.

Progress is being made. Some
countries have a good start on the
road to self-sufficiency, and excel-
lent and rewarding work is being
carried out on many different
varieties of crops. There is con-
cern; there is hope, and with the
involvement of Canadians such
as the three men whose article
we are publishing, we know there
will be action.

An interesting sidenote: Mac-
donald is offering a new credit
course for students who are in-
terested in foreign agriculture.
Evening Course students, wishing
to take the course for non-credit,
may also enrol. This, I think, is
another positive answer to the
question "What is Canada Doing
to solve the World Food
Shortage?"

Hazel M. Clarke.

A recent special television program on the world's food crisis produced some startling facts regarding the food crises occurring in many countries. One of these was that of the 200 or so countries of the world, only four produce more food than they need. These are the United States, Canada, Australia, and Argentina. This fact, perhaps more than any other, demonstrates the severity of the world food situation.

The concern in recent years over the world food supply situation has produced numerous ideas and attempts to solve the problem. These attempted solutions have ranged from massive shipments of grain and other food items to nations such as India and Pakistan to world conferences at which world leaders and "experts" cite facts and figures to substantiate the need for something to be done. In between these extremes, we see such solutions as providing technical assistance and farm inputs. Also common are long-term loans and grants to allow food deficient countries to finance the development of their agricultural industries.

Surely all of these are part of the solution to the problem. The crisis is so complex that it re-

quires more than just one simple solution. Yet it is with increasing frequency that we read of such single simplistic solutions. Perhaps this is a reflection of our attempts to deal with a situation that is becoming increasingly desperate.

One such solution has centred on the feeding of grains to livestock. People in Canada and the U.S. are being told that they are extravagantly wasting grain by feeding it to animals instead of shipping it abroad to feed hungry people.

By the most reliable estimates available, about half of the world's grain production is consumed directly by humans, while the other half is used to produce animal protein. It is estimated that if only four percent of that grain fed to animals were used instead to feed undernourished people, it would virtually eliminate the food shortage. Thus we could still use about half of our world grain supply to produce animal protein.

It sounds like a logical and simple solution to the problem. It probably could work if it were not for all

of the other political and economic problems associated with a grain transfer. With current unstable world economic conditions, grain-rich nations are demanding increasing compensation for their food shipments in order to improve their balance of payments situation. And the countries that need this grain the most are least able to pay. Also as critical resources such as petroleum and food become more short, they take on a growing political importance as to their sale, distribution, and use.

Thus we can see that it is very difficult to offer a simple solution to a complex problem and still remain realistic. This doesn't mean the situation is beyond hope, however. But it does mean that its solution is going to require the application of many solutions that are realistic or feasible within today's economic and political climate.

Gordon Bachman

What is Canada Doing to Solve the World Food Shortage?

Earlier this year the Women Associates of Macdonald College sponsored a panel discussion on "What Is Canada Doing To Solve the World Food Shortage?" Members of the panel were Dr. George Dion, The Reverend Tom Edmonds, and Dr. H. A. Steppler. Professor J. Neilson was the panel moderator.

Dr. Dion, former Dean of the Faculty of Agriculture and Vice Principal of Macdonald College, is currently serving as special adviser in agriculture to CIDA (Canadian International Development Agency). Mr. Edmonds received his B.Sc (Agr.) from Macdonald in 1957. He then took his degree in Divinity and spent eight years as an agricultural missionary in south-central Brazil. He has just recently returned to that country. Dr. Steppler is a Professor of Agronomy at Macdonald and a member of advisory committees in various programs at international research centres. He has also been a special adviser in agriculture to CIDA. Professor Neilson is Director of the School of Food Science at Macdonald College.

Much of the panel discussion centred on the work being done by CIDA which is a government agency established to oversee Canada's external assistance program. Multilateral programs such as United Nations agencies and development banks are supported by CIDA. Food aid, technical assistance, and bilateral economic aid are also a part of CIDA's program. Under their auspices students and trainees from developing countries study in Canada and Canadian educators and technical experts work in many countries on CIDA programs. The

discussion that follows will centre mostly on CIDA's work in agriculture in developing countries.

The Journal would like to thank the panel for allowing us to publish a condensed version of their discussion.

Dr. George Dion

I don't think many people know very much about the magnitude of the problem of feeding the world's population. What we tend to do, of course, is to divide the number of people in the world, which is known very inaccurately, into the available food supplies, which is known even less accurately, and decide whether or not that makes an allowable average diet and then calculate how much more is needed to meet the requirements. That may be fine for statisticians and economists, but it has very little to do with real life. Unfortunately, the world will continue to be divided among rich countries and poor countries, and within these countries — rich or poor — there will be rich people and poor people, people that eat well, people that don't eat well, starving people, and poverty. This is important to keep in mind when looking at the situation. I don't think it makes any sense to look at the food problem globally, it must be on the basis of country by country. And, unfortunately for some, each country has to solve its food problems on its own.

If you look at the magnitude of food aid, it takes a very small country and tremendous amounts of food aid to make any kind of an impact. For example, wheat is

a significant part of the Indian diet. India's wheat production is about 26 million tons a year. Canada's food aid promise at the World Food Conference was one million tons a year. If all of that went to India, it would increase their supplies by four per cent. The obvious answer is that each country is going to have to produce its own food.

That may bother us more than it bothers some of the people in some of these other countries because we, in Canada, can take a very pure approach to this problem and decide what other people should do and what we are going to try to do to help. In fact, one rapidly learns that hunger and starvation are not strange phenomena in many of these countries. An individual in a hungry country looking at his fellows there mentally divides them into: them and us. "We are going to make it; some of them aren't — isn't that too bad." In some countries that's about the only answer there is, whether we like it or not.

What is Canada doing? Canada is providing one million tons of wheat. The amount that goes out in other products occasionally receives some attention but almost all of Canada's food aid is in the form of wheat or flour, and what we have pledged for the future at the World Food Conference is somewhat more in terms of tons than we have traditionally been supplying. Because the price has gone up, it means that to supply the same amount of food will require approximately three times as many dollars. Let me make a small diversion here. All of us have grown up with the knowledge that food has always been surplus.

Certainly there have been local disasters and famines but globally food has always been surplus. However, we found out when the Russians bought into the wheat market, and they bought only about four per cent of the amount that was going into the international trade, that as little as that changed a traditional surplus into what I am convinced will be a chronic shortage. We are at a stage where, for the first time in human history, the number of mouths is outstripping the supply of food and I don't think we shall ever see a surplus of wheat again. We are entering an era when we can expect to see chronic and continuing shortages. We have something like a 28-day supply of wheat in the world pipeline. It used to be that three times that much was considered a critical level. I have grave reservations as to whether the stocks will be increased to the point where we can look with some degree of comfort at the situation in general or where we can say we have something in the cupboard against one lean year let alone seven. I introduced the above because I was referring to the marked increase in the price of wheat, how much Canada pledged in food aid and how much more that is going to cost now than it has in the past. Consequently, an increase is going to be necessary in CIDA's budget.

I don't think we shall ever see cheap food again. We, as consumers, can expect to see food continue to get more expensive, and I think this is perfectly normal. I can't think of anything that hasn't got more expensive. We are going to see the pursuit of scarce food by nations that need to buy food in ways that we should have got used to during the last couple of years but to which we are psychologically not conditioned. We are going to have more examples of rich countries and rich people making sure that they eat and this may be at the expense of poor countries and poor people.

Canada is supplying not only food aid in the terms of the promise made at the World Food Conference but also other kinds of commodities on loan or grant basis. We are the major contributor to the international market in potash. Potash exports on an assisted basis are a very important part of our contribution to increased food supplies in other parts of the world. As we import all of our phosphate from the United States and process it in Canada, there seems little likelihood of Canada being a major supplier of phosphate to other countries, particularly since our phosphate manufacturers are on a quota already which is somewhat lower than their traditional demands have been. With regard to nitrogen, we are not a significant producer on the world scale. We produce about three per cent of the world's fertilizer nitrogen.

What I really would like to delve into more deeply is that CIDA is involving Canada in various kinds of technical assistance designed to increase the cereal supplies in particular countries.

Canada can point with pride to the assistance that CIDA has provided to the government of Kenya. At the plant breeding station at Njoro, which is their main wheat breeding station, we have been able, with the assistance of the University of Manitoba and its Department of Plant Science, to have a team of plant breeders working for about the last eight years with the Kenyans to devise new wheat varieties to keep ahead of the new races of stem rust that are produced in that hot bed of rust variation. Somewhere in Kenya, Ethiopia, or Tanzania, there is a place where all the rust races of the Middle East and East Africa originate. The plant breeding station at Njoro produces germplasm that is very significant in keeping ahead of the race with rust and warding off disaster from that particular scourge. Unfortunately, Kenya, which used to be a

wheat exporter, is now a wheat importer primarily because they are not prepared to pay their producers enough to encourage them to raise as much wheat as they need, and it is more profitable to raise other crops. Consequently, Kenya finds itself temporarily short of wheat.

We have, in addition, a team in Tanzania working on the problems of producing wheat under the rain-fed conditions in that country. Because of two years of very poor harvests due to bad weather, the amount of wheat acreage has been reduced and Tanzania is in dire need of wheat. CIDA recently made an allocation of \$8 million worth of wheat to tide them over. We have a team of agronomists working in Tanzania to develop the kind of dryland technology that will permit them to raise their own supplies of wheat. And it is not an insoluble problem. Tanzania has a 10,000-acre wheat farm and for the last four years we have had Canadian farmers assisting and advising the farm manager and working with agronomists from the Prairies to develop the technology that is most suitable. We have high hopes that that farm this year will produce about one-third of Tanzania's wheat requirements. And, if we are successful in the advice and guidance that we give, and if the farm machinery that we have made available under reduced term loan agreements does the kind of job we expect it to do, it is not very hard to conceive of two or three more of these 10,000-acre farms and Tanzania meeting its food requirements in the immediate future.

We have a team in India working on the problems of moisture conservation and dryland farming. They are centred at Hyderabad but are working with 23 different federal and state experiment stations throughout the dry parts of India where crops are grown on rainfall and without irrigation. That program has demonstrated techniques which have not been ap-

preciated by the Indian cultivator of the past. There has already been adoption of some of the new techniques, and the program is now being studied to see if Canada can involve itself in an extension program to bring to the Indian farmer the kind of practices that the Canadian team, in collaboration with their Indian colleagues, has demonstrated on the 23 different research stations under the various kinds of moisture stress that exist. You will appreciate that some of the problems are also complicated by the fact that Canadians do things on a mechanical basis, which makes it very easy to conduct timely cultivation with mechanized equipment over fairly large areas in a relatively short time. If one is going to do this with oxen, it reduces very seriously the amount of land that a man can look after and limits the size of his holding. In addition he has to have machinery that can be pulled by oxen to do the kind of job that is necessary. In general, in India, that kind of machinery has not existed.

I was involved late last year in an interesting operation in Zambia, formerly Northern Rhodesia. It is a country that has traditionally eaten maize but now imports about 120,000 tons of wheat a year. That costs about \$300 a ton at present, and they are spending a great deal of hard-to-get foreign exchange on wheat. You might ask why do these people need wheat and the answer is relatively simple. It has very little to do with status, contrary to what some people think. It has to do with the mid-day meal. People who don't eat at home take lunch either to the field, the factory, or to the mine. It is very difficult to make an acceptable mid-day meal out of corn meal mush. You can't make a sandwich out of corn meal mush, and the function of wheat is for bread as a convenience food for the sandwich.

Zambia has not been involved in wheat production. They had, in

the past, a small amount of wheat under irrigated conditions and we looked at this and decided that, even if the climate is pretty warm and juicy for part of the year, the country can't be so bad that we can't raise wheat. We devised a scheme which will involve sending Canadian farmers to establish small wheat farms in Zambia which will be roughly equivalent to our own wheat farms. Each Canadian will work with a Zambian and perhaps after two years will turn that farm over to the Zambian and start another one and so on. This plan is still in the developing stages.

In many cases we are going to have to change our style of operation and, in view of the urgency of the situation, be somewhat less, shall I say, diplomatically correct than we have been. We are going to have to be ready, in some instances, to say, if you the recipient country are interested, we will try to come in and raise food with you and for you, instead of advising. Advice, of course, is worth what it costs. It is very easy to ignore. If the advice isn't followed, the adviser can usually find an excuse as to why it didn't work. We would like to remove some of the excuses.

The Reverend Tom Edmonds

I really don't have any answers or solutions to the food problem; possibly there aren't any, but I will tell you what might be done, for the problem can't be ignored.

I think that the world can feed itself, but I doubt very much that it has got the will. One concern, which some of us have right now, is that a good deal of the aid either directly or indirectly is tied to Canada's own business and commercial interests. A lot of the aid that is given through CIDA, and certainly through the various international banks and their Canadian counterparts, is based on the assumption that what the world

needs is to get involved and get into the sort of consumer credit economy that we have here on this continent. Much of the aid creates a dependency on a technology whose control is really in the hands of the elites of the world. When I talk about the third world or the developing world I think of it more in sociological terms than in geographical terms. We have a bit of a third world here in Canada. I haven't had any recent experiences with CIDA but I have done some very interesting reading and talked to people who have been involved. As an example of what I've just said CIDA has, as a part of its program, about \$30 million, out of a total budget of about \$680 million, which goes to non-governmental organizations — NGOs. This money is used to help churches, CUSO, and various Canadian private and independent organizations that are involved in the third world. The money is used mostly on the matching grant idea. The United Church of Canada, with which I am involved, for example, last year received about \$406,000 in matching grants from CIDA. One of the problems is that CIDA is putting more and more strings on this money and some of us are very much afraid of being corrupted. That is, we are going to get into a position where we like and become dependent on big money. We will be happy to have the power that goes along with the money, but then we will find out that we will not be able to do what we really want to do.

Various countries in South America, for example, have what they call National Development Foundations. Their whole purpose is to bring marginalized groups of people in some of the Latin American countries into the consumer credit market. They will lend money to small groups of people who cannot get credit from banks with the avowed purpose of helping these people become worthy of bank loans. I don't know about you but I find it a doubtful honour to become worthy of a bank

loan these days. I question whether non-governmental organizations should get involved with this kind of thing. Are we not going to lose our souls, if I may use the Christian word, at the same time as we gain the entire world?

The other problem that I am very much concerned about is technology. As a former Dean of this Faculty once told me, progress is sometimes teaching somebody to use a scythe rather than a sickle. That kind of assistance might be more important than introducing a rice combine, made in Winnipeg. I think that in many third world countries today it is exactly at that basic level that development and the food crisis have to be attacked. We heard in the '60s about the Green Revolution, the high yielding varieties of rice and wheat developed by the Ford and Rockefeller people. Yet many farmers in India went bankrupt and lost their land when they tried to introduce those seeds into their own farming operation. Without the accompanying social changes and land distribution that is necessary to introduce high-yielding seeds that need irrigation and fertilizer, it is impossible for the average small farmer to get along. Consequently, he loses his land, goes into the city and becomes one of the 460 million people who don't have enough to eat. That is what I am afraid of. It's not only that aid is not enough or that it is tied to our own business and commercial interests, as it very definitely is, but also that it actually hinders, in some cases, the development of people and their solving of their own food situations.

We worked in the interior of Brazil in a frontier area which was one of the first land distribution schemes to be set up. Over an area of about two townships, it has about 8,000 farms of approximately 80 acres each. Some of it is on good land, good heavy red clay, some of it on very sandy land. This

colony was set up by planners in Rio in 1943, and on their maps they drew the roads, where people should build, where schools should go. It had its ups and downs as governments and situations changed. We were there from 1962 until 1971, and it was then essentially a rural or agricultural slum of about 150,000 to 180,000 people living under very bad conditions.

We heard that CIDA was sending a team to Brazil to look into all of the various needs. We — including the local mayors, Brazilian agricultural workers, and politicians in the area — thought maybe this would be a place where CIDA could work. And through the various official channels we invited and encouraged CIDA people to come out and suggest various things for which the money might be used. I don't think they've gone yet.

It's that lack of contact with the majority of the farming people that prevents our aid from getting down and doing something at the grass roots level. Even the agricultural specialists in the third world countries are generally people from the elite; people whose experience has either been as a son of a large landowner, who is maybe part of the problem, or somebody who has a university education and is in a very good situation.

We went to one of the IRI (International Research Institute) experimental stations to see if they had anything in agricultural extension for our particular area. It was a great place. I was shown into an air-conditioned room. They had the most up-to-date experimental equipment and were doing something with micro-elements in the soil affecting coffee. I realize that was important because Brazil gets a lot of its dollars from coffee export. But, essentially, they were doing nothing to feed most of the people there and I repeat it is that lack of contact with the

majority of the farming people that bothers me. Here in Canada we do not have that wide separation between the majority who work the land and those who are in agricultural colleges or experimental stations.

The world can feed itself. There is enough land. There are enough resources if they are properly distributed. There is enough know-how if it is applied and if it is applied at the local level. In the whole aid and food picture nobody mentions China. We ignore them with their 800 million people who, after about a quarter of a decade, seem to be able to feed all of their people — maybe not as we eat but certainly much better than they have been accustomed to eating for centuries.

To me it's a matter of will, of morals. Yes, indeed, it's a matter of Christianity, not in the sense of us being purists and telling other people what to do, but in the sense of us letting other people do what they must do. And I'm afraid that's not really happening and our aid program is partly responsible because of the way it's tied to our own interests in Canada, tied into our own technological background, and tied into the kind of economy and kind of society that we have here.

Dr. Howard Stepler

I feel that Dr. Dion was a bit cynical in his opening remarks. I don't think the situation is quite as bad as he paints it. But what I would like to discuss is an equation in which we have on one side the world population, and we also have as a multiplier of that world population the caloric requirements to maintain an individual, and on the other side of the equation we have the capacity of the world to produce food. The equation should balance but, unfortunately, it doesn't. When you have a situation with three variables in it and

none of them fixed, the problem is: How can you bring this situation into balance? You cannot do it by looking solely at one side. We cannot look at the problem of the world food supply and the ability of the world to feed itself without looking at the finite side of the world in terms of physical resources and also the size of the world in terms of its population. If the world population continues to grow at the rate at which it has been growing, then something has to give somewhere.

The factor in the equation which ultimately begins to change very markedly is the caloric requirements — the calories that are available to meet man's demands. We do have finite world resources. Dr. Dion mentioned some of these, phosphorus fertilizer for one. Recent figures that I have had on the world phosphorus supplies have, fortunately, been increasing. I am not sure if this is as a result of finding new phosphorus or rather an improvement in the statistics themselves. It was estimated that the world supply was equal to 90 years. But even more recently other figures have come out stating the world phosphorus supply is equal to about 400 years. There is a rather disquieting note to add, namely that most of this, about 50 per cent, is in one country — Morocco — and, if you add the Spanish Sahara, then you have well over 50 per cent of the world's known phosphorus supply.

When I was in Colombia recently, I discovered that they have a lot of phosphorus, but the unfortunate part is that it is extremely poor phosphorus. It's about one per cent available whereas I think the North American phosphorus rock is around 12 to 14 per cent. However, there are phosphorus supplies and this immediately suggests a challenge to agricultural research to find ways in which this phosphorus rock can be made more usable for agri-

cultural production, because I certainly agree with Dr. Dion that it's these resources in food production that become so critical in the world's capacity to produce food for itself.

If you look at the calorie side of the equation, the figures that one gets are something of this kind. The average use of wheat or wheat equivalent by a person in a developing country — India, for example — is something in the order of 375 to 400 pounds per annum per person. One person in North America consumes on the average one ton of wheat per year of which something in the order of 200 pounds is used as wheat or wheat products; the remainder is consumed in the form of meat, milk, eggs — a wasteful way, if you look at this in a world context, to use a plant resource. One of the choices that is going to face many of us in developed countries is to change our own eating habits so that we are using fewer calories for the production of these rather wasteful foods, those which are produced by an animal eating plant calories.

I'm not sure that we can leave the food problem to be solved by each country on its own. We have to ask "Am I my brother's keeper?" and while the answer is "yes" I think it is very much a qualified yes and that he had better do something about the problem himself as well. One of the things which I feel the countries must do is show the will to get their own population growth under control. The World Population Conference, which was held in Bucharest last fall, was a near disaster. It was rather an amazing thing when one considers that two of the parts of the equation which I mentioned, two variables in it, were discussed in two separate conferences with absolutely no reference from one to the other. At the World Population Conference and a few weeks later the World Food Conference in Rome these two things seemed to be discussed as virtually unrelated problems.

One of the disquieting factors is that China and Argentina have now apparently reversed their population policy and are going for increased population growth for defence purposes. In the army an SIW (self-inflicted wound) is treated as a criminal offence, and I'm not sure but what uncontrolled population policies in individual countries are nothing more than SIWs on a national scale.

One of the areas which holds great promise for the future as far as I am concerned is new agricultural technology. Tom Edmonds mentioned the Green Revolution, the new wheats and the new rices, and it's true that to capitalize on these and to get the real benefits that these cultivars have one needs optimum conditions as far as irrigation and fertilizer are concerned. But given these two, then the capacity to produce food is much in excess of that which is inherent in the traditional cultivars of rice or of wheat.

The wheats, which originally made their impact in Mexico, resulted in Mexico going from a wheat importer to a net wheat exporting country. The new technology, at least in one year, created a situation in which India was almost self-sufficient in wheat. Unfortunately, these cultivars are not insulated against climate. We haven't yet been able to find technologies which can insulate our materials from climate unless we can bring in the additional factors such as irrigation.

One might also say that this kind of technology such as the Green Revolution is, in fact, a bad thing because it disrupts the traditional relationships between the landowner, the lease land farmer, and the landless labour. The policy problem which must be solved in most of these countries is whether or not we are, in fact, looking for development of the individual as well as development in the food

supplies or whether we are looking for development in the food supplies and increased productivity in the foods themselves. I am afraid that I am cynical to the extent that if you try to get answers to all of the problems so that you wind up with a technology which is completely safe in every situation, you will never get a technology. Nothing will ever happen because there is always some little factor that has to be retuned somewhere. And while some of these technologies, such as the ones in the Green Revolution, do require additional inputs such as fertilizer and irrigation, nevertheless there are others coming out of research which do not require this.

One of the most interesting ones is the bean program at the International Centre (CIAT) in Colombia. This is a grain legume which is the basic food source for millions of people in Latin America. CIAT scientists have by one very simple technique, been able to demonstrate that bean yields can be tripled and that simple technique is to produce virus-free seed. It doesn't require any additional fertilizer inputs. All it requires is disease-free seed, and this has been demonstrated not just in the research station but in the fields in Guatemala. This is the kind of technology that can go a long way in improving the capacity of the world to feed itself.

There are three requirements to improved agricultural production, which in turn affects agricultural development, and finally rural development: namely new technology is required which is equal to or better than the current technology that the peasant farmer is using; secondly, motivation is required so that the farmer will, in fact, use that new technology, and thirdly, government policies are required which are designed to improve the agricultural scene.

We, as people in agricultural research, are certainly concerned with the first area of new technology development. We should also be concerned, to some extent, with the second area of motivation, although in this we have to get the social scientists and anthropologists involved as well. It is a bit arrogant on our part as agricultural scientists to think that we have all the answers to what motivates people to accept new technology and to use it. And thirdly, we all have to convince governments that unless there is a policy which appears to be and is, in fact, aimed at agricultural development, this development will not take place.

Question — Are you in favour of the large farms such as the one mentioned in Zambia? Do you not consider it possible that the small farm is what is going to keep many of these people fed?

Dr. Dion — Zambia is an essentially empty, unpopulated country with tremendous areas of good land that are not used. It represents the same kind of situation that existed on the great plains of North America before they were settled, and there is no policy of filling up the land by immigration the way we did. For people who like to farm big, there is a lot of land available in Zambia. Small farmers are not being displaced by making big farms.

Tanzania also has lots of unused land at the present time and government policy, at present, is that food production *per se* is as important as social development. In some unpopulated parts of the country they have said, "we are going to make some wheat factories." I don't think that it will be government policy to continue the spread of large farms at the expense of land for the small cultivator. The answer basically depends on the pressure of popu-

lation on land in each individual country.

Dr. Steppler — There are approximately 100 million pigs in Latin America and 90 million of these are on farms with about one to three pigs. These are not sows but pigs that are largely scavengers — garbage units — on the farm. There are very few large pig operations, and the problem is how to get technology to these farmers. Something in excess of 60 per cent of the farms in Latin America are very small farms, less than three hectares in size.

CIDA is a government operation, while NGO, (Non-Government Organization) which Tom Edmonds mentioned, is not a government operation and thus can operate at the individual farm level. I can recognize the sense of frustration that he feels when looking at CIDA money going in and working for the government while he is working for the small farmers and can't seem to get any of that money pried loose for use on the small farms.

I would like to point out to Tom Edmonds and to others the importance of the eight or nine International Agricultural Research Centres located in various countries of the world: the IRRI (International Rice Research Institute) in the Philippines, CIMMYT (International Maize and Wheat Improvement Centre) in Mexico, CIAT (International Centre of Tropical Agriculture) in Colombia with several crops — cassava, beans, corn, rice, beef, and swine, CIP (International Potato Centre) in Peru, IITA (International Institute of Tropical Agriculture) in Nigeria, ICRISAT (International Crop Research Institute for the Semi-Arid Tropics) in India, two animal institutes, ILCA (International Livestock Centre for Africa) in Ethiopia and ILRAD (The International Laboratory for Research on Animal Diseases) in Kenya. The important point is that all of these centres

are now recognizing the need to move from the development of technology for the commodity — such as new wheat technology, or new rice technology, or new cassava technology — to becoming more concerned with the farming system within which those new commodities are going to be used on individual farms within the areas of their responsibilities. The problem of how they are going to do it is very difficult to grasp. What is the contribution that an international centre can make in changing the farming system for the very small farmer? These international centres are, by and large, developing what they call scale-neutral technology. It is not a technology which is associated with a large farm because there is nothing in a cultivar or a new variety of wheat that says it must be grown on a farm of 1,000 hectares. The unfortunate thing is that there are additional parts to that technology which may be easier for a large farmer to obtain than a small farmer — credit, purchase of fertilizer, purchase of irrigation, markets — but I don't question but what they are struggling with these aspects. I know that CIAT is, but the problem is how do you do it. Nobody denies that it is the direction in which one must move but how to do it is the problem when you consider the number of people that are involved and the very, very small human resources that the international centres have.

Question — Do you think that we must stop paying lip service to community development; that we know that we can and should do something to help?

The Reverend Tom Edmonds — From my point of view the question of development is for who and it seems most of it is for us. If things get kind of tight, then the rich nations with power are going to command the market. All the development that has gone into farms to produce large crops will be for

our benefit because we can command the market.

I prefer community organizing to community development. Development is another way of saying how can we get what you've got here in our hands.

But I would like to talk about something Howard Stepler mentioned and that is the energy problem. I found something of interest in a journal concerning the energy efficiency of an operation. In Borneo, where they practice the traditional slash and burn kind of operation, for every calorie that is put into the operation 16 calories are taken out. In the wet rice cultivations in China for every calorie that is put in 50 calories are got out. And on this continent we need 20 calories to produce one calorie. I wonder if anything has been done on the energy efficiency of farming operations. The whole question of oil in the next 15 years is going to be the key question in food production.

Dr. Stepler — the point you should recognize when looking at energy used in food production in North America is how much of it is actually used in primary food production and how much is used in all the infrastructure — the processing, the convenience foods that society demands — because all of these things add to the energy required or used in food production. There is no question but what the calories required to produce a bushel of corn have increased slightly over the last 20 years. This is where, as agricultural scientists, we may have buried our head in the sand in saying that agriculture was the most efficient area of activity in society because we have gone from a point where it took nine people in agriculture to feed one outside of agriculture to a situation in which one person in agriculture could feed 40 people outside of it. We set this up as a measure of efficiency, and it was in terms of

man-hours but not in terms of total energy.

Additional sources of energy are being studied. There is, for example, technology available to take plant material and produce oil out of it. Another is organic wastes — the estimate is that if all the animal organic waste in the United States was processed into an oil, it would equal 20 per cent of the current fossil fuel requirements of that country. It would probably equal all of the U.S. fuel requirements for heating.

There are even suggestions, and they go counter to our conventional thinking in agriculture, that we should now start producing plants in which we have an excess of organic matter. This is in place of the old idea of having a high harvest index in which we got a lot of the economic part with very little of the non-economic (a lot of grain versus the straw). We now should go to a situation where we can increase the straw production as well as the grain production and use the straw as a fuel source and the grain as a food source. There is concern.

There are also statements to the effect that there is enough hydro electric energy being lost annually in the Himalayas, Nepal, to equal all of the proven fossil fuel reserves in the world. If such energy were used in the old Haber process to fix nitrogen and produce nitrogen fertilizer, then we could free the gas currently used for use in some other way.

Question — How can we increase motivation in the people of different countries?

The Reverend Tom Edmonds — My own experience is that people are motivated provided that the basic physical needs are taken care of — that people are able to eat sufficiently to work and so on. When they are treated as human beings, when they are not

sold a bill of goods, when they are not told that they need things which they don't need, when Canadians or other foreigners go there not to impose but to learn. It is when we open up the possibilities for them to fulfil themselves in their own culture and in their own environment that is important. I'm afraid that we have gone to countries and destroyed cultures and imposed our technology and our environment on other people. Motivation also comes from having a cause.

If I may, I would like to bring up another point. Most of the Canadian exports in the last 10 years have increased 200 to 300 per cent in value. Most of the things which developing countries have exported to us have increased by about 75 per cent in value. Our style of living must not mean the exploitation of other people and our business and commercial life must not get rich at the expense of hundreds of millions of people. I think in one sense it begins here. We have to say that aid does not just go where Canadian exports are going, so that the countries have the dollars to pay for them. Aid should not be tied up like this. The fact is that 80 to 90 per cent of CIDA's actual aid is actually spent on Canadian goods and services, and that's a quote from the President of CIDA. Sixty per cent of the NGO aid is spent in Canada. When we talk about aid, we should also talk about organizing our economic and social life in such a way that it doesn't exploit others. That's not easy, of course, because we're only one country and we are also influenced by other people who exploit us. It's not easy but that, to me, is the direction which we must take.

Dr. Dion — With regard to tied aid, Canada has a legal requirement that 80 per cent of bilateral aid should be spent in Canada, and must have a minimum Canadian content of $66\frac{2}{3}$ per cent. I would prefer untied aid, but I can defend tied aid. This is a provision

that is apparently built into the system because it meets the wishes of our representatives in the House of Commons. It can be defended because what Canada can supply is what Canada has — goods and services. Canadian people and Canadian material. There are times when I would like to see an agricultural operation have much more untying than 20 per cent for local costs, particularly if we are going to concentrate on helping countries defeat, at least temporarily, their food problem.

There is another factor in this tied aid business and that is that CIDA's budget at the present time is about \$900 million a year and we've got approximately 25 million people in Canada. That is \$36 for every Canadian man, woman, and child and, if there are five people in the family, that's \$180 per family. A lot of these families are not paying much income tax. The question is how much are Canadians prepared to contribute to this effort? It is a very real question. If one has the principle of providing what we have in Canada in the way of goods and services, then at least we are recycling some of this money in Canada and making more taxpayers to help carry the burden. As I said, I would prefer not to defend it but there are some practical considerations that are worth pointing out. I'm not sure how much untied aid Canada would be prepared to pay for if it were put in terms of how much each individual taxpayer would be contributing.

Dr. Stepler — There are two comments I would like to make. One is with reference to untied aid. Canada was a very active partner in looking at the problem of untied aid and how this could in fact operate in working with other bilateral countries. When you travel around some of the developing countries and you look at the structure within the country, you begin to realize that if you

untied aid to developing country "X" what would happen is your Canadian dollars would flow into some other developed country and all you are going to be doing is building up the economy of some other developed country. Emotionally the urge is to supply untied aid and while there is every emotional reason why it should be done, there is a very hard, practical reason why it isn't.

I would like to look at the question of motivation for a moment. One of the reasons why so much of the technology that has been generated in developed countries and transmitted to developing countries has been unsuccessful is because we have not fully understood the factors which motivate a farmer within that developing country. We have operated too much on the assumption that every farmer is an economic animal and he responds to economic factors, and if you demonstrate to him that some particular procedure or particular technology will result in an increased income for him, he will automatically rush out and grab it. We lose sight of the fact that there are millions of millions of small farmers who are not economic animals at all. The things that motivate them are really the avoidance of risk. We must understand that and design our technology in such a way that it does show him that it will avoid risk. The risk for him is not the risk of not being able to buy a new car next year, but rather the risk for him is not being able to feed his family next year. Unless we can demonstrate that technology is capable of minimizing that risk, we don't have much chance of really transmitting that technology. This is one of the reasons why so much of the technology has appeared to be ineffective. This is one of the areas in which the international centres are trying to come to grips. They are attempting to understand these factors of motivation and to design technology and systems of transferring that technology that will

be effective. You will have to remember that we are talking about maybe only 500 professionals in the world who cannot possibly transmit this to all the small farmers in the world. We have to train the nationals of the various countries in the ways the technology can be demonstrated, modified, and adapted by their own farmers. We are concerned with this type of a problem, and it's a problem of considerable magnitude; it's not simple.

The Reverend Tom Edmonds — Obviously 66 $\frac{2}{3}$ per cent is a constitutional requirement. In a speech by the President of CIDA, he said: "we know that 80 — 90 per cent of the bilateral money is currently (1973) being spent in Canada on Canadian goods, commodities, and services; 7,564 contracts have been placed with Canadian firms in the last three years and a recent study has indicated that CIDA will be responsible for the maintenance of over 48,000 man-hours of work in the 73-74 fiscal year."

I don't think that untied aid means that all of a sudden we take the three or four hundred million dollars and divide it up among all the countries and say "here". Obviously we would end up with supporting huge farms and 80 per cent of the people on the small ones would never get anything because the people who would control Canadian aid in these countries are the very small percentage of the population. Aid should be given to projects such as small co-ops or small loans and this kind of thing that will get down to support real people. We know how to do this in Canada, so surely we could pick out those projects in other parts of the world that will do the same thing for the majority of people there, and any other projects we could just cut off. Maybe our aid budget would be reduced by a great deal. It would be better than what it is now.

Dr. Dion — I think Howard Steppler

did a very modest job of talking about the international institutes and their accomplishments. Canada has something to be proud of in its support of these institutes. We are their second largest supporter after the United States — at the present time we put about \$4.3 million a year into them because we think they're very important. The new rices that have come out of IRRI produced \$3 billion worth of additional rice each year and IRRI hopes to have a budget for the first time of \$10 million in the coming year. That's a pretty fair return.

The wheat that comes out of CIMMYT, in India alone, stepped up the production of wheat from 12 million tons to 26 million tons in about seven years, simply due to the possibilities of getting greatly increased production by the kind of genetic engineering that these people are doing. These are not miracles — they're the result of plain hard work, common sense, inspired genetics, and plant breeding power.

The same kind of results are on the doorstep with beans. It has not taken off yet in maize, partly because it was complicated by the hybrid maize picture and the temporary requirements to get new seed every year which doesn't suit peasant cultivators. That philosophy and technology has been changed, and I fully expect to see a green revolution in maize within a year or two. We can look forward to exactly the same kind of results in the sorghums and millets that are being tackled in ICRISAT in India and in some of the other legume crops with which they are concerned. The kind of potentialities that have been demonstrated at CIAT with cassava indicated that the same tremendous production increases are possible — more than doubling on a field scale. It is these kinds of thing that make the difference. When the Mexican wheats were introduced into India after it was demonstrated by farm-

ers that they could get their wonderful yields, the varieties spread like wild fire. They would have spread, I'm convinced, even if there had been no agricultural research service or extension service. The moral of this is that if you have the right technology and the right tools and something that will demonstrate to the farmer that he can, as Howard Steppler said, with a minimum of risk double his income, he'll do it.

We've been investing more than \$4 million a year in this kind of enterprise because we have faith that it can be done in many crops and multiply greatly in the crops where the triumphs have already been demonstrated. The Green Revolution is just beginning.

Dr. Steppler — As an added note to those remarks, improved rice is occupying 98 per cent of the irrigated rice acreage in Colombia. This is probably one of the greatest successes of new cultivars. To talk about doubling yields of cassava or yields of corn in the developing countries doesn't mean that you are doubling the yield that is obtained in southwestern Ontario. We're talking about doubling a yield of about 20 bushels to the acre and this is not really very much when you go from 20 to 40 but this is doubling the yield. The world yield of cassava is about six tons per hectare. We have cultivars and techniques at CIAT that will regularly produce 42 tons of cassava in 10 months. This sort of technology is just around the corner. In two years' time there will be cassava varieties, bean varieties, and corn varieties — changes have already taken place in the whole thinking of corn breeding as Dr. Dion has indicated. These changes are going to take place. These are the real challenges and real hopes for the future. The other, of course, is the tremendous amount of land that is still available in the world for agricultural production once the technology is developed for it.

The Family

Farm

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Apple Growing in Quebec

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1. Beginnings

The apple tree, whose fruit played a role in the first human drama, has a quite extensive natural range and is grown in nearly all temperate zone countries. Its popularity is due to the nutritional and health value of the apple which, it is said, is the most universally loved fruit. It is thus not surprising that seventeenth century France, a country where fruit-growing flourished, should have presented its new colonies with a few apple trees. In the Province of Quebec, the origins of apple growing are merged with those of agriculture.

Louis Hébert is said to have brought apple trees to New France in 1617. In the "Relations des Jésuites," one finds this excerpt from a letter written at Quebec by Father Lejeune in 1636: "Mr. Hébert is said to have planted during his lifetime a few apple trees which bore quite good fruit from what I am told; the cattle have damaged his trees." It is logical to think that the first plantings were made in the immediate vicinity of Quebec, where colonization began.

It seems that the first orchard established at Ville-Marie was planted in 1650 by the Sulpicians on the slopes of Mount-Royal. In 1663, Pierre Boucher wrote: "Not many trees have been introduced here except for a few apple trees which bear an abundance of fruit." These bountiful trees must still

have been very few in number. In 1694, Father Chouchetière of Ville-Marie, reported: "The wild trees and seedlings bear very good apples . . . This year we saw a tree laden with big apples in June and one of its branches was in bloom." A 1698 census established that there were in Port Royal, where Louis Hébert had settled in 1610 before going to Quebec, 1,584 apple trees belonging to 54 families, several of whom owned between 75 and 100 trees.

These historical references seem to prove that apple growing existed in New France from the start. It is difficult to trace its progress; in fact, it is two centuries later before we know anything definite about it. We may suppose that apple growing gradually won favour with the settlers and with those who followed them because of the many ways in which the fruit could be used.

The first settlers brought with them apple pips which they planted. The young trees which grew from these seeds bore fruit and in time a superior variety arose and was propagated. Chance-spread seeds grew up in fence rows and other neglected spots; these too multiplied and did their share in producing good varieties. It is from such trees that fine varieties like Fameuse and McIntosh sprang.

In 1925, Professor T. G. Bunting of Macdonald College said: "In this province not very long ago there were trees of the Fameuse variety well over a century old which unfortunately died during the harsh winter of 1917-1918." He also said he had proof that certain apple

trees had lived for centuries and mentioned that there existed in Nova Scotia a 150-year-old tree which, in 1925, was still healthy and yielding abundantly. In the United States, some apple trees are said to be 200 years old.

The situation around 1800 seems to have been that most farms had some apple or crab-apple trees and that there were five or six apple-growing districts of some importance. At that time, the agricultural press was just beginning and there were no experimental farms. Little was being written about apple growing. However, progressive farmers read foreign publications, conducted their own experiments and passed the results on to their neighbours. It is recorded that a certain J. H. Spingle died suddenly while writing an article about apples in which he described the theories of Dr. Van Mons of Belgium and of Thomas Andrew Knight of England concerning the creation of new varieties.

The first grafts were made in 1823 by Colonel Samuel Jackson who settled in Abbotsford in 1819. A few years earlier, in 1810, another colonel, M. O. Dwyer, of the same parish, obtained from the Spalding nursery at Mount Shefford three apple trees grafted with the varieties Late Strawberry, Blue Permain and Flat Graft. Budding or shield-grafting was not attempted till 1846 by Thomas Johnson following the publication of an article in the June issue for that year of the Montreal periodical, *People's Magazine*, which illustrated the technique. We need not be surprised at the

interest shown by this publication in a horticultural subject because at the time fruit growers discussed their problems in public. They helped trigger the Taché inquiry into agriculture in 1850.

In 1849, horticulturists founded their first association known as the "Société d'Horticulture de Montréal." It appointed a fruit committee which held four meetings in 1854. Twenty-five years after its founding, the society decided that the vague conditions under which those members interested in the progress of the fruit sector were operating had lasted long enough. It instructed its fruit committee to inquire into the kinds and varieties of fruit grown in Quebec and to submit a report. In the list of apple growers chosen to carry out this task, the names of the following leading growers appear: J. J. Gibb, J. Jordon, S. S. Bain, J. H. Pringle, James Day, J. F. Guilbault, G. L. Marler, Henry S. Evan, W. Brown, J. Middleton, Archibald Fergusson and others. The president was N. Cotton Fisk who started the first commercial nursery at Abbotsford in 1857. The secretary of the committee was Ch. Gibb who, in 1882, imported the first Russian apple trees into Quebec.

With a view to greater efficiency, the committee appointed a sub-committee for each of the principal fruit-growing districts with instructions to report on the local situation. Abbotsford, Missisquoi, Brome, Chateauguay Basin, and L'Islet were among the districts surveyed. To obtain information, questionnaires were sent to apple growers. The answers were condensed in a general report published in 1877. This gave an ex-

cellent idea of the state of the orchards and it teems with interesting historical notes, as shown by excerpts cited by J. H. Lavoie, director of the Horticultural Branch of the Quebec Department of Agriculture, in a lecture to the Pomological Society in 1943, 50 years after that society was founded.

As regards the Abbotsford apple-growing district, one of the oldest in Quebec, we learn that the first seedling orchard was started there by Joel Frizzle, the man who built the first house on the site of what is now Montpelier, Vermont. This one-arpent orchard yielded its first crop about 1812, maybe a little earlier. The Fameuse variety and two lines of Russets — the Pomme Grise and the Bourassa — were brought to Abbotsford from Montreal in 1826 by the Reverend Joseph Abbott. At the end of the 19th century, Abbotsford trees formed the basis of many large Quebec orchards.

When apple growing was begun at Abbotsford, it was not necessary to spray against insects and diseases. Cows and sheep were put to pasture in the orchards. When it was found that the animals were destroying the young shoots which they could reach, grazing was stopped. After that, the hay was cut for storing in the barn. When it became necessary to spray, the hay was left in the orchard as a mulch. The first fertilizer used was barnyard manure, then nitrate of soda, which in turn was replaced by sulphate of ammonia. Later, a compound fertilizer, usually 9-5-7, was used.

The introduction of spraying with Paris Green is attributed to Robert Brodie, of St. Henri, Montreal. This was in 1884, eight years before the Bordeaux mixture, formula 4-4-40, made its appearance. Horticultural libraries — that of Abbotsford and those of other apple-growing districts — were not well stocked. One could, however, find in them information about the destruction of insects, about their habitat, and on experiments conducted by the apple growers of the American Northwest, thanks to the results they communicated to Quebec friends in exchange for the information they received from them.

In 1874, Abbotsford fruit growers formed an association and, a year later, it published a fruit list for Quebec. It was the first document of that kind in the province. In 1879, this Growers' Association received \$50 from the provincial government and the grant was doubled a few years later. In 1876, the association held its first exhibition in the local cheese factory, where 189 apple entries were displayed. Prizes were not high but the exhibition was successful beyond all expectations.

In 1888, spraying to combat outbreaks of diseases and insects was introduced at Abbotsford with good results.

In his report to the Fruit Committee of the Pomological Society, the representative of the Chateauguay Basin region, Robert Jack, wrote in 1877 that an orchard had been planted more than 80 years earlier by Father Brugère, the parish priest. Apples from this orchard were displayed at

the Abbotsford exhibition in 1876 by Mr. Wright who then owned the plantation. Mr. Southwich, representative from Mont St. Hilaire on the above-mentioned committee, wrote: "Upon my arrival in St. Hilaire in 1822, there were a few young orchards and many old ones. Only one orchard has a few grafted trees, among which the Fameuse variety was the favourite. Mr. Finley, of Lachine, owned the first grafted orchard at St. Hilaire."

According to Mr. David Westover, of Frelighsburg, the oldest orchards, in 1876, were grown from seed, but few were then bearing. Most of the grafted trees came from Rochester, N.Y. The only varieties which had some value were Golden Russet and Talman Sweet. About 1850 his father had started a small nursery in which there were 13 varieties of apple trees.

We learn from Mr. Sydney Fisher, of Knowlton, that, in 1877, fruit production in his area was rather limited but that the few orchards in existence were growing and yielding well. Where did the trees come from and where were they grafted? We do not know for sure. Most of the survivors from long ago were destroyed during the winters of 1855-1856 and 1862-1863. About 1865, a local nurseryman produced good apple trees. In 1877, there were only two or three 100-tree orchards in the County of Brome and a few plantations of 50 trees.

This information, although scanty, still gives an idea of what apple growing was like in the principal production districts in 1877. The expansion of apple growing goes back to 1890 and it was in 1892 that the Quebec government began to make serious efforts to develop it. Until then, private enterprise and the efforts of a few horticultural associations, including that of Montreal (the oldest) which was started in 1847, had been responsible for the spread of apple growing in Quebec.

During three quarters of a century, the Pomological Society, founded in 1893, was to be an important progressive factor for apple growers. The improvements it brought to apple growing coincided, at the beginning, with the development phases initiated in 1893 by the Honourable L. Beaubien, commissioner of agriculture. This first conspicuous government impetus took the form of establishing small model orchards and opening a school of practical arboriculture at La Trappe, Oka.

At the inauguration of the St. Hyacinthe Dairy School on March 11, 1893, Mr. Beaubien spoke of these new measures in the following terms: "Apples are a big industry. I intend making every effort to promote it. Next spring, I shall entrust every deputy with the planting of a certain number of fruit trees and I would ask that each such plantation be made into a small model orchard for the county. To encourage and spread growing, I have established a school of arboriculture at the Trappist monastery at Oka, where the growing of fruit trees and

forest trees, pruning, grafting, wine-making and fruit preserving will be taught free of charge."

This school contributed to a considerable increase in the area of fruit plantations, particularly in the Montreal district.

At the instigation of the Pomological Society, the government established in 1898 the first six fruit stations and, in 1911, the first four demonstration orchards; on this occasion, it appointed the first officials specially entrusted with inspection and demonstration work. In 1914, the Quebec government set up a Horticultural branch, which was to strive effectively to promote the various kinds of horticultural production including that of tree fruit. Apple growing was one of the activities of the new branch whose first director was Mr. J. H. Lavoie, forestry engineer and agronomist.

2. Development of apple production

Study of the production records reveals certain well-defined trends and clearly shows that Quebec's apple growing industry has undergone extensive transformation since its beginnings. The increasing crop volume is one of its interesting aspects. No official data are available before 1870 but it can be assumed that earlier total annual production did not exceed 400,000 bushels, the first known quantity. This was also the time that the growers themselves became aware of the problems of Quebec apple growing. The first available data are unreliable because of lack of com-

communications, the wide dispersion of commercial orchards and markets and the host of home orchards made it impossible to gather reliable data. However, let us take it for granted that Quebec produced 410,000 bushels of apples in 1870, one million in 1890 and two million in 1900. According to the 1901 census, there were 1,472,000 trees in bearing and 780,000 young ones.

It seems surprising that the province should have doubled its apple production from 1890 to 1900, but this substantial increase can be plausibly explained, if not by larger plantings, then by better insect and disease control, renovation of old orchards and better care of the crop. Annual reports of the Pomological Society bear witness to such progress but it is impossible to put it into figures.

In 1916, Professor T. G. Bunting estimated that Quebec had 2,250,000 bearing trees and 160,000 young ones. Only 25 per cent of the latter had a good framework. The winter of 1917-1918 was extremely cold and hard on apple trees and they suffered considerable damage. In the fall of 1918 the secretary of the Pomological Society, Mr. Peter Reid of Chateauguay Basin, summed up the damage in the following terms: "For all districts, damage caused by the winter ranged between two per cent for Fameuse and McIntosh to 80 per cent or 90 per cent for Ben Davis."

A study of the statistics yields some surprising facts. The 1900 crop reached a peak which was

unequaled for another 50 years later. In 1920 production sagged to one million bushels and it was from 1941 to 1945 that it registered its lowest five-year average with 760,000 bushels. Owing to adverse weather conditions, the 1945 crop of 80,000 bushels proved to be the smallest in Quebec's apple growing history. The 1945 season was marked by an almost complete failure of the apple crop in the Montreal region and by ideal conditions for the spread of scab. However, the Quebec region was spared and the crop there was quite good.

The 1974 crop was the largest one. Its 6.5 million bushels exceeded by 250,000 the previous record of 1971. The quite wide variations in yield shown by the apple crop from year to year are one of the hazards of apple growing. Canadian apple production as a whole shows similar variation, for example, 16.4 million bushels in 1939, 12.8 million in 1940, 7.6 million in 1945, more than 19 million the following year, and so on. The number of apple trees, estimated at nearly 1.5 million in Quebec at the beginning of this century, was assessed at 1.6 million in 1930. The harsh winters of 1895, 1903, and 1917 caused considerable damage to apple trees, but the winter of 1934-35 was the worst. In December and January, persistent cold brought the temperature down to 40 F. below zero. Damage caused to Quebec orchards was heavy. A survey indicated that 100,000 apple trees had died as a result of the cold spell. The proportion of trees killed by the cold was estimated at 50 per cent in the Montreal district and 25 per cent in the Quebec district.

In 1971, there were 950,000 bearing apple trees in Quebec and something like this total will probably be maintained during the coming years. In fact, the apple growers now seem more concerned with maintaining than developing their orchards. Trees are being planted to renew rather than enlarge commercial orchards. The most recent wave of new plantings was in the thirties. This was started by the formation of the Cie des Vergers Modèles, at Frelighsburg and it involved the whole district comprising Frelighsburg, Dunham, Bedford, and Sweetsburg, which in less than three years gained 50,000 young trees.

During the past 15 years, there has been a decline in the number of apple growers. Once estimated at over 2,000, their number had fallen to about 1,500 by 1960, of whom 1,100 were located in southwestern Quebec. The number of orchards by apple-growing districts was then as follows: Rouville, 285; Missisquoi, 120; Huntingdon, 198; Chateauguay, 135; Deux-Montagnes, 234; Sherbrooke, 31; Bois-Francs, 30. Instead of a scattering of small orchards, we now have fairly well defined apple growing areas.

At the same time, these areas have been changing. Old apple districts are disappearing, specifically those of the Island of Montreal and immediate vicinity. Apple growing in the Quebec region is dying out. In 1974, it accounted for only 100,000 bushels of the provincial production while Rouville contributed 1.9 million, Deux-Montagnes 1.5 million, Huntingdon, Missisquoi and other

counties, one million bushels each. Certain centres are declining because of urban development, which is the case for St. Hilaire, Rougement, Mont St. Gregoire and others.

The apple crop, which once comprised over a hundred varieties, now includes only about 15 main ones. Late varieties account for 90 to 95 per cent of it and the early crop is practically limited to Melba, Yellow Transparent, Duchess and Wealthy. The latter two varieties had their years of glory but that is over now. As far back as 1950, the development of others foretold such change.

The McIntosh is now the uncontested queen of Quebec apples with its 80 per cent contribution to the annual crop, followed by such late varieties as Cortland, Lobo, Fameuse, Red Delicious and a few others. Fameuse (like Duchess and Wealthy) after having had its heyday with other varieties in Quebec has faded into the background of less vulnerable and more popular apples; in 1925 it still accounted for 50 per cent of Quebec production, but it now accounts only for two to three per cent of it. Increased McIntosh production has created a major problem in scab control. On the other hand, fire blight now causes little trouble to growers because varieties highly susceptible to it have been eliminated.

A review of the work accomplished in insect and disease control, fertilizer application, and cultivation methods shows that, here also, growers can be proud of their accomplishments. There is, however, a growers' problem which remains unsolved and that is the orderly sale of a crop whose annual value varies between \$6 and \$8 million. Let us hope that the expectations aroused by the prospective creations of a joint apple marketing plan will be realized; about 500 commercial growers are looking forward to the results.



Serving the Community

The *West Island* branch (Baldwin-Cartier County) of the Quebec Women's Institute is one of our newer branches. They are in Lachine, a city which is part of the Metropolitan area of Montreal. The membership fluctuates as husbands are continually being transferred to other cities, but in spite of this the branch is a very active one in the community.

Their special interest is in the work of the V.O.N. and they have two members on the local committee.

Members are available if a driver is needed to take someone to the Welfare office or to sit with an elderly person while the family has to shop or go to the Welfare office, etc. They will buy groceries for someone who is unable to go to the store herself. They have gone with someone who did not know too much about proper nutrition and have helped her to choose and spend wisely. They have given donations for groceries and have also given a donation to the V.O.N. towards the purchase of a car that was urgently needed on the West Island.

Funds for their projects are raised mainly from the lunches they provide in the evenings at the Q.W.I. annual conventions and, in the fall, a bazaar, where they sell all kinds of handmade articles, used clothing and so on. This is usually a very successful venture. Last year they compiled a cookbook which sold well and the funds were given to the Associated Country Women of the World organization (ACWW) for their "Operation Eyesight" project.

Last spring marigold seeds were planted in jiffy pots and distributed to the kindergarten children in the English school and prizes were given in June for the best results. This year they have distributed them in the French school. This project has been a very interesting one for the children involved in it.

Interesting speakers are heard at each meeting. A recent one was a City Councillor who was urged to work for the beautification of the Lakeshore and for the preservation of some of the old buildings in Lachine, which is one of the oldest cities in Canada.

Meetings are held on the first Tuesday of each month at 8:00 p.m. and they welcome visitors.

Abbotsford Activities

Abbotsford branch in Rouville (only one) has been busy with Handi bags and have filled 25 for the Canadian Save the Children Fund.

At a recent meeting a discussion was held on the importance of books for children and the lack of good libraries in Quebec.

A contest, thought up by the Convener of Citizenship, using names of Provincial Premiers or Federal Cabinet Ministers as answers, provided much interest at their meeting.

A beautiful Bible was purchased for an elderly lady (92) in Granby, who had recently lost her home by fire.

A meal for a group of about 70 members of the Eventide Home in

Montreal who went to Abbotsford to see the apple blossom was provided. This annual event is a highlight of the year — both for the Senior Citizens at Eventide and for the Abbotsford W.I.

Public Speaking

Every autumn our local school has a Public Speaking program which we (*Valcartier* branch, Quebec County) are very proud to sponsor along with the Home and School Association and the Baden Powel Chapter of the I.O.D.E.

There is usually an opening speech by a Grade 5 pupil telling everyone what they will see and hear. Last year the Grades 4 and 5 girls and boys did an old traditional Valcartier square dance. Naturally the audience got a great kick out of this performance. This was followed by a demonstration in metric measurements by some of the Grade 5 pupils. The whole group then joined in singing. One song — a long one — was in French; the others were English.

The speeches then began, with the children being very excited and anxious to do their best before their parents and friends. The I.O.D.E. ladies were the judges. They come from Quebec City and are very interested in this undertaking. They present the prizes. The winner gets his or her name on a trophy and keeps it for a certain time. This means a lot to the child that wins and the rivalry is pretty keen with everyone out to do his best. Every contestant receives a book for his efforts. Second and third place winners receive a sum of money.

In addition to drawing up their own speech (teachers making corrections and offering suggestions), each pupil must have drawings or pictures and any material which they can get to help explain more fully their subject. One girl brought in a prepared skin of a coyote. Her uncle had shot the animal when it was molesting his turkeys.

The pupils have grown to be quite responsible and carry on the program practically on their own.

Following the prize giving, lunch is served. What a relief — child and parent can relax! Some are very happy and some disappointed, but on the whole everyone is reasonably content — and maybe the girls and boys are thinking about what they will speak on in '76.

A Musical Evening

The *Compton County Women's Institutes* sponsored a musical evening which was held in Sawyerville last May. The evening began with welcome to all by Mrs. R. Stevenson, former County President, and the singing of "O Canada".

Many solos and duets were sung — some humorous, some serious, some old, some new, some Irish and Scotland was not forgotten — a selection of Scottish songs was presented by a kilted Mr. Milton Goodwin.

Besides singing, there were readings and recitations, accordion selections, an Irish jig and musical selections by many performers. Mrs. Watt, who had recently been

to Hawaii, did a hula dance and then presented Mrs. Stevenson with a pineapple she had brought back with her.

There were several musical groups on the program: family groups, the East Clifton Neighbours, a high school group, and the Northern Comforts who all did their part to entertain the audience. Last, but not least, the Nugent Orchestra played several selections and with "God Save the Queen" a very successful and enjoyable evening came to a close.

County News

Ascot W.I. (Sherbrooke County) entertained members from another branch and had fun with their Roll Call — imitating a farm animal or bird sound. They raised a nice sum with a phantom food sale. A speaker at their meeting spoke on some of the aspects of the changing roll of women in Canada and in other countries. It was felt that we should take a more active part in helping women of other countries.

The residents of the Grace Christian home were served a supper recently and a program of favourite hymns and a social time was enjoyed by all.

Grandmothers' day was celebrated in *Brompton Road* and each grandmother received a corsage.

Mrs. S. Parker, County President, was a guest at the June meeting and had a happy privilege of presenting 25-year pins to Mrs. Irene Berwick and Mrs. D. Cullen. Mrs. Parker reported on a meeting

she had attended re the building of Senior Citizen Homes in their area.

The branch has been busy catering for bowling banquets, a rummage sale and a card party. They also catered for a wedding, a Kiwanis supper, and a dance.

A book will be placed in the Regional School in memory of four departed members. They have been collecting used stamps for a Leprosy Mission and sent off 4 lbs. 4 oz. of them recently.

The branch is sponsoring a member's child at a camp for two weeks this summer.

In *Milby*, a community party was held for a member and her prospective husband and the couple was presented with a gift of coffee mugs. The WI and other friends sent a gift to the bereaved family of a former member who had been living in Dawson Creek, B.C.

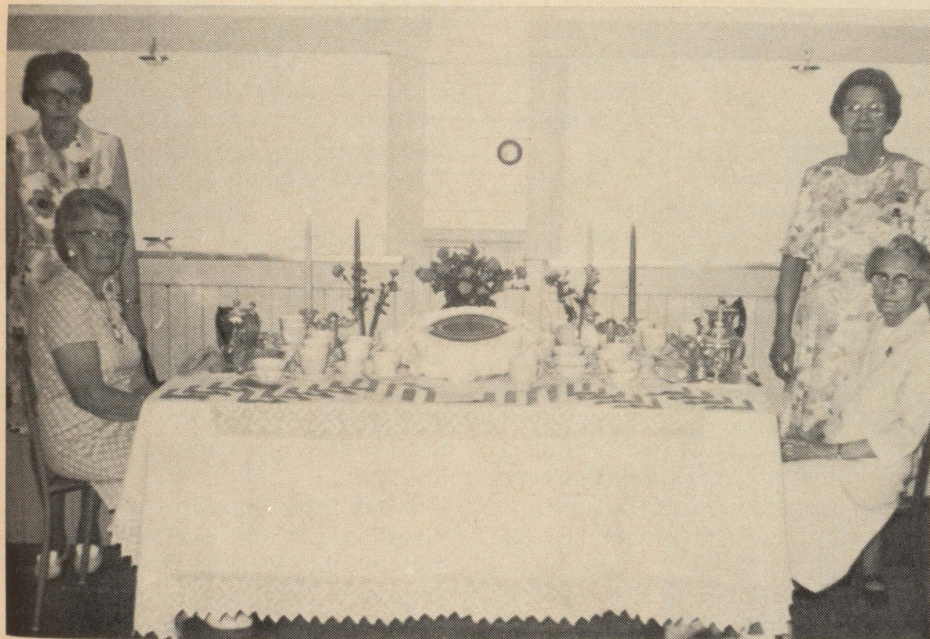
A speaker at their meeting was Mr. John Nicol who spoke on Bill 31, the Bill re. abattoirs. "We all want inspection, but don't want the small abattoirs to close."

Fun was had when the grandmothers entertained with a skit, poems, and a gift of a marigold.

Discussions were held on mandatory labelling acts and programs in *Lennoxville*, as well as on the symbols on hazardous products, standardized sizes, and on instructions for the care of clothes. Another interesting discussion concerned the possibility of Flora MacDonald, M.P. for



Top: Mrs. Neil Wilson, President and Mrs. Allen Smart, Treasurer, with the air mattress Stark's Corners WI bought and presented to the Ade Memorial Home. Below: Ayer's Cliff WI celebrated their 60th Anniversary with an afternoon tea.



for the lovely display of dolls — both in old fashioned and new styles. Several interesting antiques were also on exhibition, but it was the beautiful crocheted bedspread that caught the eye and was the centre of attention. This was displayed in the centre back of the stage. It was an example of many, many hours of patient labour by Mrs. Alice Astell, one of the village and WI senior citizens, who has only partial eyesight. The demonstrations of modern quilting, broomstick knitting, and safety pin jewellery created much interest.

A homemade and decorated cake, which was centred on the Rangers table, a what-not shelf, and two pretty blue and white cushions were drawn for at the end of the day. The Brownies sponsored the Fish Pond which was well "fished" by the children, and the Girl Guides did their bit by putting on a skit which was enjoyed by all those present.

Kingston and the Islands, being a future candidate for the leadership of the Conservative Party.

Two trips were enjoyed — one to Quebec City and another to the Botanical Gardens in Montreal.

Mr. Murray Dewing, an employee of the Hudson Bay Company, spoke to the *Belvidere* WI about the Cree Indian Reserve. He showed slides and explained about life in the North. His slides included many scenes of beautiful northern sunsets — brilliant colours because of unpolluted air. Mr. Dewing set up an Indian bead loom and demonstrated how beading was done. He had a display of Indian handicrafts to show the type of work they do.

Annual Fair

The annual May Fair sponsored by the *Hatley* Women's Institute in Stanstead County was held in the Town Hall in Hatley on May 17 with the usual successful results. The day was beautiful and many people came and were warmly welcomed by the WI members.

The agricultural stall was gay with flowering plants, flowers, bulbs, and rhubarb — all were successfully sold.

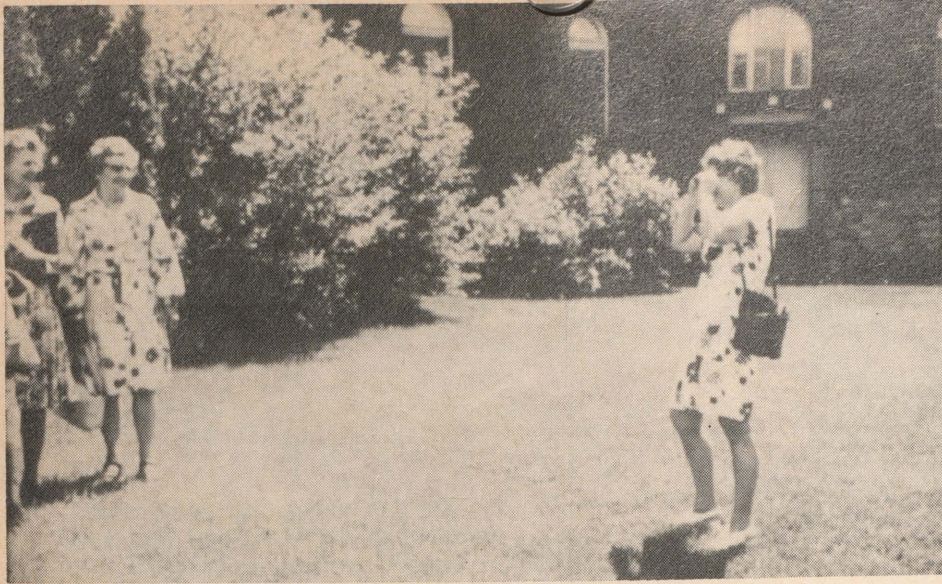
The fancywork table, with its colourful items displayed to advantage, showed the many hours of work during the winter months. As usual, the food sale table and refreshment booth were the most popular and were well patronized. Mrs. Fred Wright takes the credit

Thus another successful May Fair was brought to a close until 1976, when the Hatley Branch hope to see all their old and new friends again.

Ayers Cliff branch celebrated their 60th Anniversary in May. The members held an afternoon tea in the Beula United Church hall and the WI past and present members, from Stanstead, Sherbrooke and Brome Counties, were present.

Mr. David Campbell, a Sherbrooke lawyer, spoke at a meeting at Ayers Cliff. The topic was woman's rights — divorce, wills, etc.

Beebe branch presented an Abbie Pritchard stole to Mrs. H.S. Beane, a Charter Member of this branch. A new member was welcomed.



Publicity Convener Mrs. Jas. Robertson, who is seen here taking a photo of the Executive and guests.

Dear W.I. Members:

I hope you all had good gardens this year. It was so nice to be able to run out for fresh beans, etc., and pop them straight into the pot for a meal. They taste so good! Our berry crop was good and we had lots for jam and for freezing. Some of you have heard tips on freezing and preserving and some have seen films on pioneer life. Freezing has certainly changed the ways of preserving foods as many of us know. At our County fairs the canned vegetable and fruit sections are very small compared with 20 years ago.

Most of the Branches exchanged, sold, or auctioned plants, slips, bulbs, and seeds in the spring. This is a wonderful way of adding to our gardens, and when they grow and bloom they will always be a pleasant reminder of the person who donated them — and more so if the donor tells something about the item she brought. Care has to be taken in transplanting as some of you have learned.

Hemmingford heard a local agronomer talk on soil, fertilizers, and gardening. He gave out soil sample boxes for those who wished to have their soil tested and later advised them on what fertilizers should be used as a result of the tests.

Our old people have not been forgotten — homes have been visited, birthdays celebrated, and catered for, wool has been given to the ladies in a Senior Citizen

home. Two ladies in the Wales Home received mohair throws from the Q.W.I., and Mrs. E. Healy is receiving one on her 100th birthday. Happy birthday Mrs. Healy! Talking of birthdays, Mrs. Bulley of Arundel is another year older and is still singing and playing the piano. Happy birthday to you Mrs. Bulley!

Inverness have been busy making two quilts which they have donated to a local residence. Jams and jellies were made for their Senior Citizen home by *Jerusalem-Bethany*. *Stark's Corners* donated an air mattress to the Ade Home.

Mrs. Simon Wilson, in *Brownsburg*, was honoured on the occasion of her 50th wedding anniversary with a beautiful gold wool blanket.

Missisquoi County put on a "Variety Night" and their play was presented.

Lakefield W.I. was interested to see an article they had written about the Douglas Hospital in the Montreal Star. A recent guest speaker at one of their meetings was a former school teacher who spoke on children with learning disabilities.

Pennies for Friendship have been collected and *Argenteuil* County was happy to note they had been the second highest contributor to this fund in Quebec. They have the most branches of any county in the Province. Congratulations to Mrs. Zimmer, County President, who was named Woman of the Year in the County.

Congratulations, too, to Mrs. Glen Olsen, a WI member from *Bury*. She is the new postmistress in Bury and has been reelected for a second term as a School Commissioner on the Lennoxville District School Board and the Eastern Township Regional School Board.

The two branches in *Megantic* County gave a donation to the Thetford Mines School to be used for prizes or equipment, whichever was most needed. The 46 contestants in a Public Speaking contest in *Aubrey-Riverfield* were each presented with a certificate.

Adelaide Hoodless Rose bushes were bought and planted by members of the *Richmond Young Women's* WI. They report all the roses are growing well.

International Women's Year was remembered in *Fordyce* with their Roll Call — "Name an international woman you admire and tell why." Many interesting answers were given and some of the women mentioned were in the W.I. The guest speaker's topic at this meeting was "Women."

It is good to hear we are having new members join us. Several groups have reported this. In a previous report we heard that *Scotstown* W.I. had had to give up and we hoped they would either be able to get going again later or join another branch. *Canterbury* announces they invited the members to join their branch and three have done so. Perhaps more will later.

Mrs. J. Robertson,
Q.W.I. Publicity.

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